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University of California
College of Agriculture
Agricultural Experiment Station
Berkeley, California

SEASONAL LABOR NEEDS FOR CALIFORNIA CROPS

BUTTE COUNTY

Progress Report No. 4

by

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Preliminary -- Subject to Correction

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BRANCH OF THE
COLLEGE OF AGRICULTURE

Progress Report No. 4

Seasonal Labor Needs for California Crops

Butte County

Scope of Presentation.-- The following considerations govern the presentation of this progress report:

1. The data are confined to the area indicated above.
2. The data are confined solely to crops, livestock needs being ignored.
3. The findings apply only to occasional or seasonal labor requirements as distinguished from labor contributed by farm operators and by workers employed on a year-round or regular basis of employment.
4. Attention is concentrated upon workers required for hand tasks -- planting, thinning, weeding, hoeing, and harvesting -- without including teamsters, tractor drivers, irrigators, and shed packers of vegetables or fruits.
5. The presentation includes the so-called migratory, transient, or roving workers which comprise an important source of help needed in connection with certain tasks and at "peak" times which seasonally arise in connection with many field, truck, and fruit crops commercially produced in California.
6. This report is confined to California's need for seasonal agricultural workers because of the more pressing problems liable to arise in connection therewith. A later study is planned which will deal with other kinds of labor involved in the production of California's many crops.

Brief Description of the Area.-- Butte County is located in the northeastern part of the Sacramento Valley about 200 miles northeast of San Francisco. The Sacramento River forms its western boundary, separating it from Glenn County. Tehama County bounds it on the north, Plumas County on the east, and Yuba and Sutter counties on the south. The county has a total land area of 1,086,720 acres, 308,012 of which are listed as available for crop land by the United States Census of 1935. Further classification is as follows:

	<u>Acreage</u>
Crop land harvested	168,927
Crop failure	2,317
Crop land idle or fallow	50,130
Plowable pasture	86,638
Total land available for crops	<u>308,012</u>

Orville, located in the southern part of the county, is the most important shipping point for fruit, grain, and cattle which are raised in the surrounding foothills. In the northern part of the county, on the floor of the valley, is Chico, another important shipping center, and just east of it in the foothills is Paradise Valley which is devoted to fruit farming.

Crops, Acreages, and Production.-- The basis used in calculating occasional or seasonal need for labor, other than that furnished by farm operators and regularly employed workers, appears as table 1.

Project report no. 4

Seasonal Labor Needs for California Crops

Butte County

Source of Information.--The following considerations govern the presentation of this project report:

1. The data are confined to the area indicated above.

2. The data are confined solely to crops, livestock needs being ignored.

3. The findings apply only to occasional or seasonal labor requirements as distinguished from labor controlled by farm operators and by workers employed on a year-round or regular basis of employment.

4. Attention is concentrated upon workers recruited for short seasons -- planting, thinning, weeding, hoeing, and harvesting -- without including farmhands, tractor drivers, irrigators, and other workers of vegetable or fruit.

5. The presentation includes the so-called migratory, transient, or roving workers which comprise an important source of help needed in connection with certain tasks and at "peak" times which seasonally arise in connection with many field, fruit, and livestock operations conducted in California.

6. The report is confined to the more general needs for seasonal agricultural workers because of the more detailed studies for other kinds of labor involved with. A later study is planned which will deal with other kinds of labor involved in the production of California's many crops.

Brief Description of Butte County.--Butte County is located in the northeastern part of the Sacramento Valley about 200 miles northwest of San Francisco. The Sacramento River forms the western boundary, separating it from Glenn County. Butte County bounds it on the north, Fresno County on the east, and Yuba and Sutter counties on the south. The county has a total land area of 1,667,580 acres, 103,116 of which are irrigated as available for crop land by the United States Census of 1935. Further classification is as follows:

Acreage	
Crop land harvested	1,667,587
Crop land not harvested	2,417
Total land of Butte County	1,670,004
Irrigated land	103,116
Total land available for crops	1,566,888

Climate.--Butte County is located in the southern part of the county, is the most important agricultural center for fruit, grain, and cattle which are raised in the surrounding foothills. In the northern part of the county, on the floor of the valley, is Chico, another important shipping center, and just west of it in the foothills is Paradise Valley which is devoted to fruit farming.

TABLE 1

Basis for Calculating Seasonal Labor Requirements
Butte County

Crop	Acreage*	Production*
Field crops:		
Alfalfa †	6,850	28,311 tons
Beans *	4,500	52,650 cwt.
Grain †-- barley	37,489	426,040 cwt.
oats	3,609	32,691 cwt.
wheat	39,468	328,972 cwt.
Hay †-- volunteer and small grains	9,427	12,098 tons
Hops *	360	540,000 pounds -- dry weight †
Rice *	23,318	932,720 sacks
Sorghums †	5,377	54,428 cwt.
Sugar beets *	500	6,000 tons
Seed crops:		
Sudan grass {	975	14,825 sacks
Vegetable seed {	500	--
Miscellaneous {	600	--
Miscellaneous melons -- for seed	3,700	--
Vegetable crops:		
Honeydew melons	400	3,000 tons
Spinach canning *	1,100	4,400 tons
Fruit and nut crops:		
Almonds	7,268	3,642 tons
Apricots {	118	118 tons
Apples	617	(123,400 boxes of 45 2,976 tons (pounds (200 tons culls
Cherries	125	250 tons
Figs {	232	348 tons
Grapes -- Concord	75	45,000 baskets of 5 pounds †
all others	572	3,432 tons (of which 175 tons were dried)
Olives	4,092	3,110 tons canning 1,196 tons not canning †
Oranges	716	10,740 boxes = 21,480 field boxes
Peaches -- clingstones	2,400	28,800 tons of which 1,680 tons were dried †
freestones	576	5,184 tons of which 900 tons were dried †
Pears	309	1,018 tons
Plums	117	23,400 crates
Prunes	5,422	10,944 tons -- dry weight †
Walnuts	1,293	(318,300 pounds 383,500 pounds (merchantable † (65,200 pounds culls (estimated

Table continued on next page.

TABLE I
Facts for Calculating Seasonal Labor Requirements
Butte County

Crop	Acreage	Production*
Field crops:		
Alfalfa	5,880	25,371 tons
Barley	2,800	22,880 cwt.
Oats	87,482	422,042 cwt.
Wheat	2,802	22,021 cwt.
Hay - volunteer and small grains	22,468	228,072 cwt.
Beans	2,427	12,098 tons
Rice	200	240,000 pounds - dry weight
Sorghum	22,318	222,720 sacks
Sugar beets	2,277	24,222 cwt.
	200	2,000 tons
Seed crops:		
Grain crops	272	14,822 sacks
Vegetable seed	200	
Miscellaneous	200	
Miscellaneous melons - for seed	1,700	
Vegetable crops:		
Honeydew melons	400	2,000 tons
Squash - summer	1,100	4,400 tons
Fruit and nut crops:		
Almonds	1,268	2,862 tons
Apples	118	118 tons
	217	(122,400 boxes of 48)
		2,372 tons (sacks)
		(200 tons culls)
Cherries	222	220 tons
Pears	222	222 tons
Grapes - Concord	75	42,000 pounds of 5 pounds
All others	272	2,122 tons (of which 172 tons were dried)
Olive	4,002	4,112 tons (sacks)
Oranges	712	1,122 tons not estimated
Peaches - clingstone	2,400	10,720 boxes = 21,440 field boxes
		22,800 tons of which 1,860 tons were dried
Tree-fruit	272	1,122 tons of which 200 tons were dried
Pears	202	1,012 tons
Pistachios	117	27,400 cwt.
Prunes	2,422	10,942 tons - dry weight
Walnuts	1,222	(212,200 pounds)
		(estimated)
		222,200 pounds (22,200 pounds culls)

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Table 1 continued.

3.

Crop	Acreage	Production
Nectarines δ	54	324 tons
Pecans δ	6	10 tons
Persimmons δ	19	57 tons

* Acreage and production figures from W. L. Stile, Agriculture Commissioner, unless otherwise noted.

† Data from 1935 Census.

‡ Drying ratios used in this report are:

Hops -- 4 to 1

Peaches -- clingstones -- 7 to 1

Grapes -- 3 1/2 to 1

Prunes -- 2 1/2 to 1

Peaches -- freestones -- 6 to 1

δ Use of seasonal labor on these crops has been ignored.

Φ Figure from California Olive Association.

|| Estimate by Walnut Control Board.

Operations Requiring Seasonal Labor and Times of Need.-- Farm operations requiring the use of seasonal or occasional labor for the various crops raised in Butte County are indicated in table 2. This tabulation does not include the employing of shed workers needed to wash, pack, and prepare various commodities for shipping and marketing.

TABLE 2

Operations Requiring Use of Seasonal Labor and Times of Needs by Crops
Butte County

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-days
Field crops:				
Alfalfa	Mowing	May -- 5/6 of acreage	50	8 acres
	Raking	June -- 5/6 of acreage		15 acres
	Shocking	July -- 5/6 of acreage		30 acres
		August -- 5/6 of acreage		
		September -- 5/6 of acreage		
		October -- 5/6 of acreage		
Beans	Hoeing and weeding	June -- 50 per cent of acreage	100	3 acres
		July -- 50 per cent of acreage		
	Windrowing -- by hand	October 1-31 -- all of acreage	100	7 acres
	Threshing -- by pick-up	October 1-31 -- all of acreage	75	5 acres
Grain -- wheat	Threshing -- with combine	July 1-31 -- 75 per cent of crop	75	7 acres
		August 1-31 -- 25 per cent of crop		

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Table 1 continued.

Crop	Acres	Production
Neonates	54	324 tons
Peanut	8	10 tons
Perennials	18	57 tons

* Average and production figures from W. L. Davis, Agricultural Commissioner, unless otherwise noted.

† Data from 1935 Census.

‡ Drying ratios used in this report are:

Hops -- 4 to 1
Grapes -- 2 1/2 to 1
Peaches -- 3 to 1
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Operations Requiring Seasonal Labor and Time of Need. -- Farm operations requiring the use of seasonal or occasional labor for the various crops raised in Butte County are indicated in table 2. This tabulation does not include the employing of shed workers needed to wash, pack, and prepare various commodities for shipping and marketing.

TABLE 2

Operations Requiring Use of Seasonal Labor and Time of Need by Crop
Butte County

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per acre
Field crops Alfalfa	Mowing	May -- 5/5 of average	50	8 acres
	Haying	June -- 5/5 of average		12 acres
	Shocking	July -- 1/5 of average		30 acres
		August -- 5/5 of average		
		September -- 5/5 of average		
Beans	Hoofing and weeding	June -- 50 per cent of average	100	3 acres
		July -- 50 per cent of average		
		October 1st -- all of average		7 acres
		October 1st -- all of average		5 acres
		July 1st -- 75 per cent of crop		7 acres
Grain -- wheat	Threshing -- with combine	August 1st -- 50 per cent of crop	75	
	Threshing -- by hand	October 1st -- all of average		

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Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-days
Grain (cont.) barley	Threshing -- with combine	July 1-31 -- 85 per cent of crop August 1-31 -- 15 per cent of crop	75	6 acres
Hay -- volunteer and small grains	Mowing	May 1-31 -- all of acreage	50	8 acres
	Raking	May 1-31 -- all of acreage		16 acres
	Shocking	May 1-31 -- all of acreage		30 acres
Hops	Pruning, stringing, training, etc.	March -- 30 per cent of job April -- 30 per cent of job May -- 30 per cent of job June 1-15 -- 10 per cent of job	100	Total of 12 man-days per acre
	Picking	August 10-31 -- 2/3 of crop September 1-10 -- 1/3 of crop	100	200 pounds (green weight)
	Drying	August 10-31 -- 2/3 of crop September 1-10 -- 1/3 of crop	75	4,000 pounds (green weight)
	Baling	September 10-30 -- all of crop	60	15 bales of 190 pounds net
Rice	Seeding -- by airplane	April 25-30 -- 10 per cent of acreage May 1-31 -- 90 per cent of acreage	100	100 acres
	Binding -- 80 per cent of acreage	October 1-31 -- all of job	100	4 acres
	Shocking bundles -- 80 per cent of acreage	October 1-31 -- all of job	100	3 acres
	Threshing -- by stationary -- 80 per cent of crop	October 10-31 -- 90 per cent of job November 1-15 -- 10 per cent of job	100	50 cwt.
	Swathing -- 15 per cent of acreage	October 1-31 -- all of job	100	40 acres
	Threshing -- by pick-up combine -- 15 per cent of crop	October 1-31 -- 90 per cent of job November 1-15 -- 10 per cent of job	75	125 cwt.

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Table 2. continued.

Crop	Operation	Time of season	Per cent of work done by seasonal help	Per cent of total work done by seasonal help
Grain (cont.) Barley	Threshing -- with combine	July 1-21 -- 85 per cent of crop August 1-21 -- 15 per cent of crop	75	5 acres
	Mowing	May 1-21 -- all of average	30	8 acres
	Hacking	May 1-21 -- all of average		18 acres
	Shocking	May 1-21 -- all of average		20 acres
	Pruning, stringing, treating, etc.	March -- 30 per cent of job April -- 30 per cent of job May -- 30 per cent of job June 1-15 -- 10 per cent of job August 10-21 -- 2/3 of crop September 1-10 -- 1/3 of crop	100	Total of 12 man-days per acre
	Picking	August 10-21 -- 2/3 of crop September 1-10 -- 1/3 of crop	100	200 pounds (green weight)
	Drying	August 10-21 -- 2/3 of crop September 1-10 -- 1/3 of crop	75	4,000 pounds (green weight)
	Baling	September 10-20 -- all of crop	50	15 bales of 150 pounds each
	Seeding -- by airplane	April 25-30 -- 10 per cent of average May 1-21 -- 90 per cent of average	100	100 acres
	Planting -- by airplane	October 1-21 -- all of job	100	4 acres
Rice	Shocking	October 1-21 -- all of job	100	5 acres
	Planting -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	100	50 mts.
	Threshing -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	100	40 acres
	Planting -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	75	155 mts.
	Threshing -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	75	155 mts.
	Planting -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	75	155 mts.
	Threshing -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	75	155 mts.
	Planting -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	75	155 mts.
	Threshing -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	75	155 mts.
	Planting -- by airplane	October 1-21 -- 30 per cent of average November 1-15 -- 10 per cent of job December 1-15 -- 10 per cent of job	75	155 mts.

Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-days
Rice (cont.)	Harvesting -- with direct combine -- 5 per cent of crop	October 1-31 -- 90 per cent of job November 1-15 -- 10 per cent of job	75	125 cwt.
Sorghums -- for grain	Cutting heads -- by hand -- 75 per cent of acreage	September 1-30 -- 15 per cent of acreage October 1-31 -- 75 per cent of acreage November 1-20 -- 10 per cent of acreage	100	0.75 acre
	Threshing -- by stationary -- 75 per cent of crop	September 1-30 -- 10 per cent of job October 1-31 -- 50 per cent of job November 1-20 -- 40 per cent of job	75	13,000 pounds
	Threshing -- by combine -- 25 per cent of acreage	October 1-31 -- 60 per cent of job November 1-20 -- 40 per cent of job	75	5 acres
Sugar beets	Thinning	March 1-31 -- 16 per cent of acreage April 1-30 -- 66 per cent of acreage May 1-30 -- 18 per cent of acreage	100	0.5 acre
	Hoeing	April 1-30 -- all of acreage May 1-31 -- all of acreage	100	1 acre 2 acres
	Topping and loading	July 7-31 -- 10 per cent of crop August 1-31 -- 40 per cent of crop September 1-30 -- 26 per cent of crop October 1-31 -- 24 per cent of crop	100	5 tons
Seed crops:				
Melons -- honeydew, cantaloupe, cucumber, squash, watermelon, etc.	Hoeing, thinning, and replanting	June 20-30 -- 75 per cent of acreage July 1-4 -- 25 per cent of acreage	100	3. acres
	Picking and piling	October 1-31 -- 75 per cent of crop November 1-15 -- 25 per cent of crop	100	0.6 acre
	Threshing	October 1-31 -- 75 per cent of crop November 1-15 -- 25 per cent of crop	100	0.66 acre

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Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Vegetable crops: Honeydew melons	Picking -- for shipment	August 10-31 -- 12 per cent of crop September 1-30 -- 60 per cent of crop October 1-31 -- 28 per cent of crop November -- negligible amount	100	1.5 tons
Spinach -- canning	Harvesting	March 15-31 -- 50 per cent of crop April 1-15 -- 50 per cent of crop	100	1.5 tons
Fruit and nut crops: Almonds	Pruning	October -- 10 per cent of acreage November -- 30 per cent of acreage December -- 30 per cent of acreage January -- 30 per cent of acreage	20	0.6 acre
	Brush disposal	October -- 10 per cent of acreage November -- 30 per cent of acreage December -- 30 per cent of acreage January -- 30 per cent of acreage	20	4.5 acres
	Spraying -- 40 per cent of acreage	January -- 50 per cent of job February -- 50 per cent of job	66	4.5 acres
	Knocking	August 15-31 -- 30 per cent of crop September 1-30 -- 65 per cent of crop October 1-7 -- 5 per cent of crop	85	300 pounds
	Hulling -- by machine	August 15-31 -- 30 per cent of crop September -- 65 per cent of crop October 1-10 -- 5 per cent of crop	80	400 pounds
Apples	Thinning	May 10-31 -- 60 per cent of acreage June 1-15 -- 40 per cent of acreage	100	1/6 acre

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Table 2 continued.

7.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Apples (cont.)	Spraying -- 5 times	March 15-31 -- all of acreage once	56	2.0 acres
		April -- all of acreage once		
		May -- all of acreage twice		
	Picking	June -- 1-30 -- all of acreage once	90	2,000 pounds
		July 15-31 -- 10 per cent of crop		
		September 10-30 -- 60 per cent of crop		
		October 1-31 -- 40 per cent of crop		
	Sorting and wiping -- by hand	September -- 40 per cent of crop	90	37 1/2 boxes of 40 pounds
		October -- 35 per cent of crop		
		November -- 15 per cent of crop		
		December -- 10 per cent of crop		
	Packing -- all on farms	September -- 40 per cent of crop	90	75 boxes of 40 pounds net
		October -- 35 per cent of crop		
		November -- 15 per cent of crop		
		December -- 10 per cent of crop		
Cherries	Picking	May 1-31 -- 75 per cent of crop	100	200 pounds
		June 1-10 -- 25 per cent of crop		
Grapes	Picking -- Concord variety at Paradise other varieties	September 5-30 -- 75 per cent of crop	100	65 baskets of 5 pounds
		October 1-15 -- 25 per cent of crop		
		September 1-30 -- all of crop	100	2,500 pounds
Olives	Picking for pickling	October -- 50 per cent of job	90	300 pounds
		November -- 50 per cent of job		
	Picking for oil, etc.	December -- 20 per cent of job	90	335 pounds
		January -- 40 per cent of job		
		February -- 40 per cent of job		
Oranges	Picking	November -- 65 per cent of crop	60	50 boxes of 42 pounds
		December -- 35 per cent of crop		

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Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Peaches -- all	Pruning	November 1-30 -- 25 per cent of acreage	80	0.25 acre
		December 1-31 -- 25 per cent of acreage		
		January 1-31 -- 25 per cent of acreage		
		February 1-28 -- 25 per cent of acreage		
	Brush burning	November 1-30 -- 25 per cent of acreage	50	2.5 acres
		December 1-31 -- 25 per cent of acreage		
		January 1-31 -- 25 per cent of acreage		
		February 1-28 -- 25 per cent of acreage		
	Spraying	November -- 1/2 of acreage	75	1.25 acres
		December -- 1/2 of acreage		
		February -- 1/2 of acreage		
		March -- 1/2 of acreage		
		May 1-31 -- all of acreage		
	Thinning	May 1-31	80	1/4 acre
	Picking -- clingstones	July 15-31 -- 1 per cent of crop	80	2,000 pounds
		August 1-31 -- 62 per cent of crop		
		September 1-15 -- 37 per cent of crop		
	freestones	July 20-31 -- 25 per cent of crop	80	2,000 pounds
		August 1-31 -- 75 per cent of crop		
	Cutting clingstones for drying	August 1-31 -- 70 per cent of job	100	1,000 pounds
		September 1-15 -- 30 per cent of job		
	Other dry-yard work	August 1-31 -- 70 per cent of job	100	11 1/2 man-hours per fresh ton*
		September 1-15 -- 30 per cent of job		
	Cutting free-stones for drying	July 20-31 -- 25 per cent of job	100	1,500 pounds
		August 1-31 -- 75 per cent of job		
	Other dry-yard work	July 20-31 -- 25 per cent of job	100	11 1/2 man-hours per fresh ton *
		August 1-31 -- 75 per cent of job		

Table continued on next page.

Date	Description	Particulars	Amount	Balance

Table 2 continued

Crop	Operation	Time of need	Percent of work done by seasonal help	Output per man-day
Pears	Pruning	November -- 25 per cent of acreage	80	0.2 acre
		December -- 25 per cent of acreage		
		January -- 25 per cent of acreage		
		February -- 25 per cent of acreage		
	Brush burning	November -- 25 per cent of acreage	50	2.5 acres
		December -- 25 per cent of acreage		
		January -- 25 per cent of acreage		
		February -- 25 per cent of acreage		
Plums	Picking	August 1-31 -- all of crop	100	1,500 pounds
	Picking	July -- 20 per cent of crop	100	800 pounds
Prunes	Pruning -- 25 per cent of acreage	August -- 80 per cent of crop		
		November -- 25 per cent of job	80	0.5 acre
		December -- 25 per cent of job		
		January -- 25 per cent of job		
	Brush disposal	February -- 25 per cent of job		
		November -- 25 per cent of job	50	2.5 acres
		December -- 25 per cent of job		
		January -- 25 per cent of job		
	Picking up	February -- 25 per cent of job		
		September 1-30 -- 60 per cent of crop	80	1 ton (fresh weight)
	Dipping and drying -- 50 per cent by dehydrators	October 1-15 -- 40 per cent of crop		
		September 1-30 -- 60 per cent of job	80	6 man-hours per fresh ton †
		October 1-15 -- 40 per cent of job		
	by sun dry -- 50 per cent by sun-dry	September 1-30 -- 60 per cent of job	80	8.3 man-hours per fresh ton*
		October 1-15 -- 40 per cent of job		

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Table 2 continued.

Crop	Operation	Time of need	Per cent of work done by seasonal help	Output per man-day
Walnuts -- English	Knocking and picking up	September 24-30 -- 15 per cent of crop	100	200 pounds
		October 1-31 -- 75 per cent of crop		
Walnuts -- Black ‡		November 1-15 -- 10 per cent of crop		

* From Christie, A. W. and L. C. Barnard. The principles and practice of sun-drying fruit. California Agr. Exp. Sta. Bul. 388:40-60. 1925

† From Christie, A. W., revised by P. F. Nichols. The dehydration of prunes. California Agr. Exp. Sta. Bul. 404:7. 1929.

‡ A considerable number of persons, especially in the Chico district, work during September, October, November and December picking up black walnuts for which they receive 50 to 75 cents per sack from the shelling plants.

Findings of Seasonal Labor Needs.-- Details and summaries of seasonal labor requirements of Butte County agriculture are presented as table 3. The "size of task" are figures drawn from table 1, in terms of either acreage or output in tons, crates, boxes, or whatever unit is commonly used. The "output per man-day" is an average figure for the entire acreage or output figured in crates, hampers, boxes, or other units as indicated in the table. If the work is of a nature that requires a crew, different members of which perform different tasks, then the average shown is per man based on the entire crew. Length of day is 9 hours, November to February; 10 hours, March to October, unless otherwise stated. Wide variations in output occur between farm and farm, field and field, and season and season, because of differences in soil types, climatic conditions, weeds, yields, and other factors influencing the amount of work that a laborer can perform in a given day. Moreover, the basis of output is a mature, experienced male worker without reference to use of women, children, and more or less inexperienced help that is sometimes used in connection with certain of the tasks requiring use of seasonal workers. The column headed "available days" reflects (a) limitations set from the period within which the work must be performed because of the nature of the task, such as transplanting, thinning, weeding, and cutting, and (b) available days as determined by weather conditions, inclement weather reducing the number of days when a required task can be performed. The "required number of individuals" is given in terms of workers as noted above in connection with "output per man-day."

It is probable that the estimated number of workers required, as recorded in table 3, will often be too low, for the reason that "peaks" frequently occur, during which an unusually large proportion of the job is done in a very short period. This would naturally require a much greater number of workers than when the work is spread over a longer period, even though the total amount of labor (in man-days) remains the same.

TABLE 3

Seasonal Labor Needs -- Butte County -- by Months and Tasks

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
January	Almonds: Pruning	436 acres †	0.6 acre	727	16	46
	Brush disposal	436 acres †	4.5 acres	97	16	7
	Spraying	960 acres †	4.5 acres	214	16	14
	Olives: Picking for oil, etc.	861,000 pounds †	335 pounds	2,571	16	131
	Peaches, all: Pruning	595 acres †	0.25 acre	2,380	16	149
	Brush burning	372 acres †	2.5 acres	149	16	10
	Pears: Pruning	62 acres †	0.2 acre	310	16	20
	Brush burning	38 acres †	2.5 acres	16	16	1
	Prunes: Pruning	1,084 acres †	0.5 acre	2,168	16	136
	Brush disposal	678 acres †	2.5 acres	272	16	17
February	Totals			8,904	16	557 man-months †
	Almonds: Spraying	959 acres †	4.5 acres	214	18	12
	Olives: Picking for oil, etc.	861,000 pounds †	335 pounds	2,571	18	143
	Peaches, all: Pruning	595 acres †	0.25 acre	2,380	18	133
	Brush burning	372 acres †	2.5 acres	149	18	9
	Spraying	1,116 acres †	1.25 acres	893	18	50
	Pears: Pruning	62 acres †	0.2 acre	310	18	18
	Brush burning	38 acres †	2.5 acres	16	18	1
	Prunes: Pruning	1,084 acres	0.5 acre	2,168	18	121
	Brush disposal	678 acres	2.5 acres	272	18	16
March	Totals			8,973	18	499 man-months
	Hops: Pruning, stringing, training, etc.	360 acres	§	1,296	19	69
	Sugar beets: Thinning	80 acres	0.5 acre	160	19	9
	Spinach, canning: Harvesting	2,200 tons	1.5 tons	1,467	10	147 (March 15-31)
	Apples: Spraying -- one time	407 acres †	2.0 acres	204	10	21 (March 15-31)
	Peaches, all: Spraying	1,116 acres †	1.25 acres	893	19	47
	Totals			4,020	19	212 man-months
	Hops: Pruning, stringing, training, etc.	360 acres	§	1,296	20	65
	Rice: Seeding -- by airplane	2,332 acres	100 acres	24	3	8 (April 25-30)

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
April	Sugar beets: Thinning	330 acres	0.5 acre	660	20	33
	Hoeing	500 acres	1.0 acre	500	20	25
	Spinach, canning: Harvesting	2,200 tons	1.5 tons	1,467	10	147 (April 1-15)
	Apples: Spraying -- one time	407 acres†	2.0 acres	204	20	11
May	Totals			4,151	20	208 man-months
	Alfalfa: Mowing	2,854 acres†	8.0 acres	357	23	16
	Raking	2,854 acres†	15.0 acres	191	23	9
	Shocking	2,854 acres†	30.0 acres	96	23	5
	Hay -- volunteer and small grains: Mowing	4,714 acres†	8.0 acres	590	23	26
	Raking	4,714 acres†	16.0 acres	295	23	13
	Shocking	4,714 acres	30.0 acres	158	23	7
	Hops: Pruning, stringing, training, etc.	360 acres	§	1,296	23	57
	Rice: Seeding -- by airplane	20,986 acres	100 acres	210	23	10
	Sugar beets: Thinning	90 acres	0.5 acre	180	23	8
	Hoeing -- second time	500 acres	2.0 acres	250	23	11
	Apples: Thinning	370 acres	0.17 acre	2,177	16	137 (May 10-31)
	Spraying -- two times	814 acres†	2.0 acres	407	23	18
	Cherries: Picking	188 tons	0.1 ton	1,880	23	82
	Peaches, all: Spraying	2,232 acres†	1.25 acres	1,786	23	78
	Thinning	2,381 acres†	0.25 acre	9,524	23	415
June	Totals			19,397	23	844 man-months
	Alfalfa: Mowing	2,854 acres†	8.0 acres	357	25	15
	Raking	2,854 acres†	15.0 acres	191	25	8
	Shocking	2,854 acres†	30.0 acres	96	25	4
	Beans: Hoeing and weeding	2,250 acres	3.0 acres	750	25	30
	Hops: Pruning, stringing, training, etc.	360 acres	§	432	12	36 (June 1-15)
	Seed crops -- melons: Hoeing thinning, and replanting	2,775 acres	3.0 acres	925	8	144 (June 20-30)
	Apples: Thinning	247 acres	0.17 acre	1,453	12	122 (June 1-15)
	Spraying -- one time	407 acres	2.0 acres	204	25	9
	Cherries: Picking	62 tons	0.1 ton	620	8	78 (June 1-10)
	Totals			5,028	25	202 man-months

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
July	Alfalfa: Mowing	2,854 acres †	8.0 acres	357	26	14
	Raking	2,854 acres †	15.0 acres	191	26	8
	Shocking	2,854 acres †	30.0 acres	96	26	4
	Beans: Hoeing and weeding	2,250 acres	3.0 acres	750	26	29
	Grain -- wheat: Threshing with combine	22,201 acres †	7.0 acres	3,172	26	122
	Barley: Threshing with combine	23,899 acres †	6.0 acres	3,984	26	154
	Sugar beets: Topping and loading	600 tons	5.0 tons	120	20	6 (July 7-31)
	Seed crops -- melons, etc.:					
	Hoeing, thinning, and replanting	925 acres	3.0 acres	309	3	103 (July 1-4)
	Apples: Picking	268 tons †	1.0 ton	268	13	21 (July 15-31)
	Peaches -- clingstones: Picking	230 tons †	1.0 ton	230	13	18 (July 15-31)
	freestones: Picking	1,037 tons †	1.0 ton	1,037	9	116 (July 20-31)
	freestones: Cutting for drying	225 tons	1,500 pounds	300	9	34 (July 20-31)
	freestones: Other dry-yard work	225 tons	4	259	9	29 (July 20-31)
August	Plums: Picking	4,680 crates †	28.5 crates †	165	26	7
	Totals			11,238	26	433 man-months
	Alfalfa: Mowing	2,854 acres †	8.0 acres	357	26	14
	Raking	2,854 acres †	15.0 acres	191	26	8
	Shocking	2,854 acres †	30.0 acres	96	26	4
	Grain -- wheat: Threshing with combine	7,400 acres †	7.0 acres	1,058	26	41
	Barley: Threshing with combine	4,218 acres †	6.0 acres	703	26	28
	Hops: Picking	1,440,000 pounds**	200 pounds**	7,200	18	400 (August 10-31)
	Drying	1,080,000 pounds** †	400 pounds**	2,700	18	150 (August 10-31)
	Sugar beets: Topping and loading	2,400 tons	5.0 tons	480	26	19
	Honeydew melons: Picking for shipment	360 tons	1.5 tons	240	18	14 (August 10-31)

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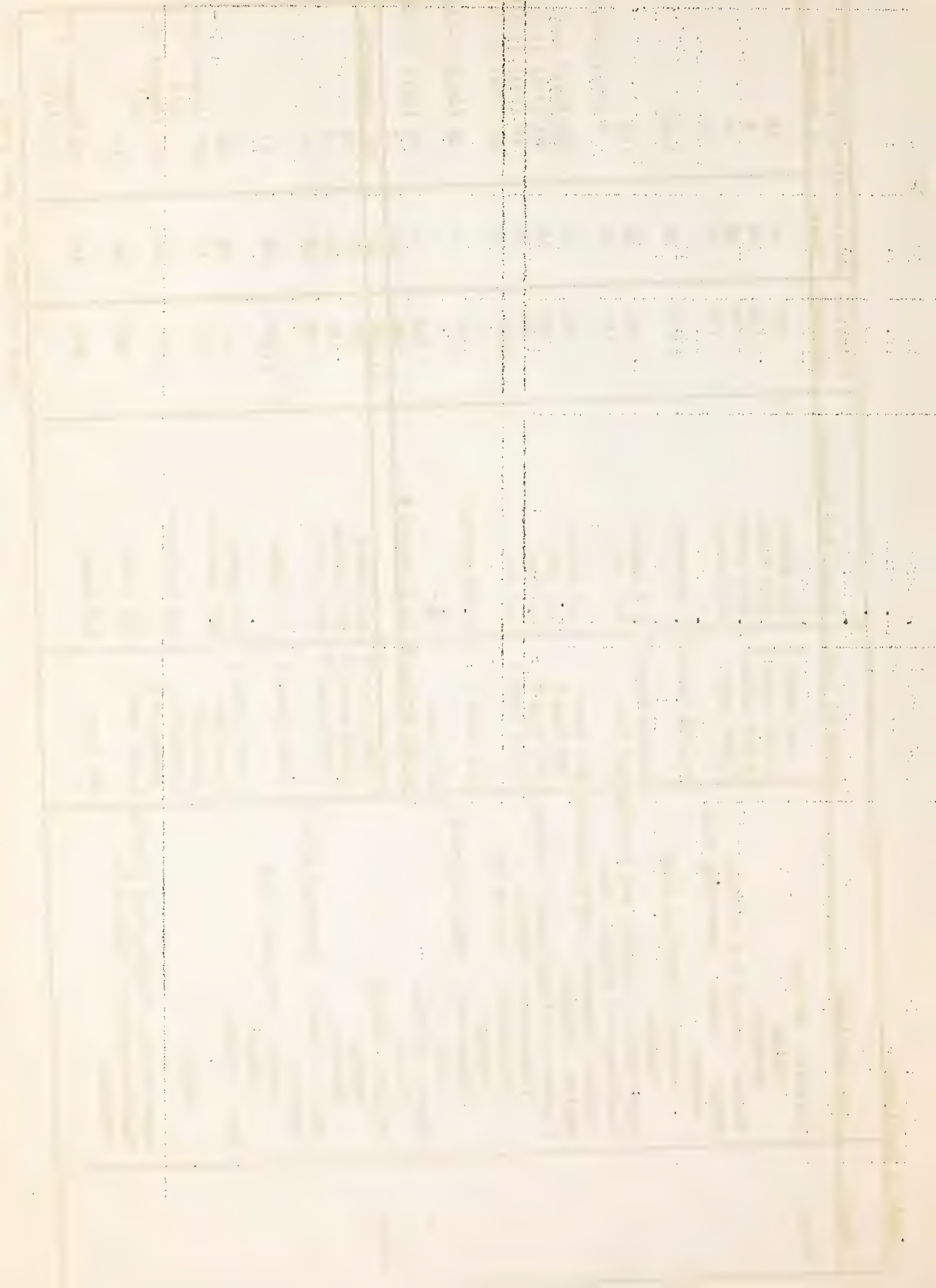


Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-day	Available days	Required number of workers*
August (cont.)	Almonds: Knocking	929 tons †	300 pounds	6,194	13	477 (August 15-31)
	Hulling -- by machine	874 tons †	400 pounds	4,370	13	337 (August 15-31)
	Peaches -- clingstones: Picking	13,285 tons †	1.0 ton	13,285	26	511
	freestones: Picking	3,110 tons †	1.0 ton	3,110	26	120
	clingstones: Cutting for drying	1,176 tons	1,000 pounds	2,352	26	91
	Other dry-yard work	1,176 tons	A	1,352	26	52
	freestones: Cutting for drying	675 tons	1,500 pounds	900	26	35
	Other dry-yard work	675 tons	A	776	26	30
	Pears: Picking	1,018 tons	1,500 pounds	1,358	26	53
	Plums: Picking	18,720 crates †	28.5 crates †	657	26	26
September	Totals			47,379	26	1,823 man-months
	Alfalfa: Mowing	2,854 acres †	8.0 acres	357	25	15
	Raking	2,854 acres †	15.0 acres	191	25	8
	Shocking	2,854 acres †	30.0 acres	96	25	4
	Hops: Picking	720,000 pounds**	200 pounds**	3,600	8	450 (September 1-10)
	Drying	540,000 pounds**††	400 pounds**	1,350	8	169 (September 1-10)
	Baling	324,000 pounds ††	2,850 pounds ††	114	17	7 (September 10-30)
	Sorghums -- for grain: Cutting heads by hand	605 acres	0.75 acre	807	25	33
	Threshing -- by stationary	3,062 cwt. †	130 cwt.	24	25	1
	Sugar beets: Topping and loading	1,560 tons	5.0 tons	312	25	13
	Honeydew melons: Picking for shipment	1,800 tons	1.5 tons	1,200	25	48
	Almonds: Knocking	2,012 tons †	300 pounds	13,414	25	537
	Hulling -- by machine	1,894 tons †	400 pounds	9,470	25	379

Table 3 continued.

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
September (cont.)	Apples: Picking	1,607 tons †	1.0 ton	1,607	17	95 (September 10-30)
	Sorting and wiping -- by hand	59,520 boxes † † †	375 boxes † †	1,588	25	64
	Packing	59,520 boxes † † †	75. boxes † †	794	25	32
	Grapes -- Concord: Picking	37,750 baskets † † †	65. baskets † † †	581	21	28 (September 5-30)
	Other varieties: Picking	3,422 tons	2.25 tons	1,521	25	61
	Peaches -- clingstones: Picking	8,525 tons †	1.0 ton	8,525	13	656 (September 1-15)
	Cutting for drying	504 tons	1,000 pounds	1,008	13	78 (September 1-15)
	Other dry-yard work	504 tons	†	580	13	45 (September 1-15)
	Prunes: Picking up	13,133 tons †	1.0 ton	13,133	25	526
	Dipping and drying -- by dehydrator	6,567 tons †	†	3,940	25	158
October	Dipping and drying -- by sun	6,566 tons †	†	5,450	25	218
	Walnuts: Knocking and picking up	57,525 pounds	200 pounds	288	5	58 (September 24-30)
	Totals			69,950	25	2,798 man-months
	Alfalfa: Mowing	2,854 acres †	8.0 acres	357	22	17
	Raking	2,854 acres †	15.0 acres	191	22	9
	Shocking	2,854 acres †	30.0 acres	96	22	5
	Beans: Windrowing -- by hand	4,500 acres	7.0 acres	643	22	30
	Threshing -- by pick-up	3,375 acres †	5.0 acres	675	22	31
	Rice: Binding	18,654 acres	4.0 acres	4,664	22	212
	Shocking bundles	18,654 acres	3.0 acres	6,218	22	283
	Threshing -- by stationary	671,558 cwt.	50. cwt.	13,432	15	896 (October 10-31)
	Swathing	3,498 acres	40. acres	88	22	4
	Threshing -- by pick-up combine	94,438 cwt. †	125 cwt.	756	22	35
	Harvesting -- with direct combine	31,479 cwt. †	125 cwt.	252	22	12
	Sorghum -- for grain: Cutting heads -- by hand	3,026 acres	0.75 acre	4,035	22	184
	Threshing -- by stationary	15,038 cwt. †	130 cwt.	118	22	6
	Threshing -- by combine	608 acres †	5.0 acres	122	22	6

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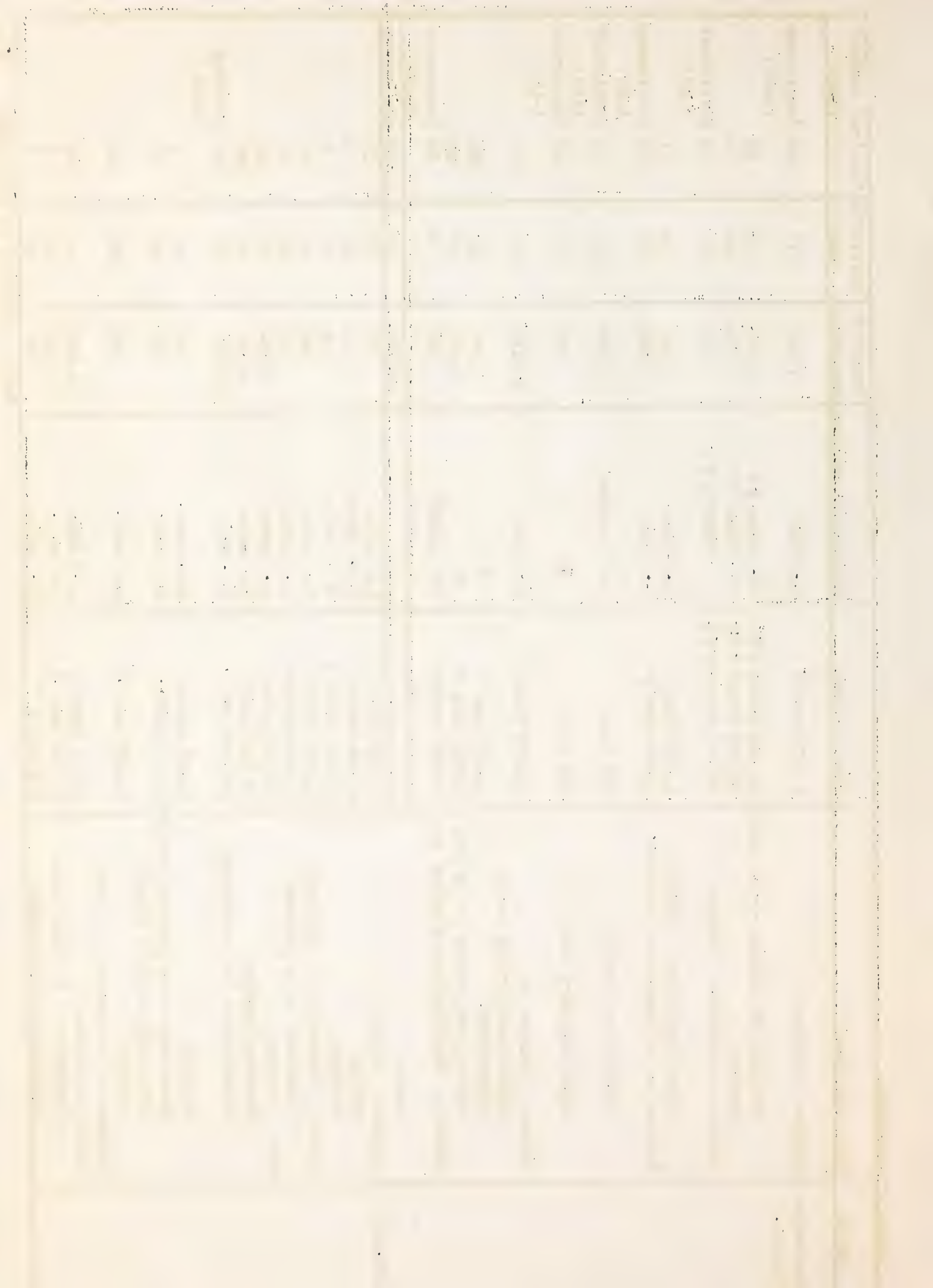


Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
October (cont.)	Sugar beets: Topping and loading	1,440 tons	5.0 acres	288	22	14
	Seed crops -- melons, etc.: Pick- ing and piling	2,775 acres	0.6 acre	4,625	22	211
	Threshing	2,775 acres	0.66 acre	4,205	22	192
	Honeydew melons: Picking for shipment	840 tons	1.5 tons	560	22	26
	Almonds: Pruning	146 acres †	0.6 acre	244	22	12
	Brush disposal	146 acres †	4.5 acres	33	22	2
	Knocking	155 tons †	300 pounds	1,034	5	207 (October 1-7)
	Hulling -- by machine	146 tons †	400 pounds	730	6	122 (October 1-10)
	Apples: Picking	1,071 tons †	1.0 ton	1,071	22	49
	Sorting and wiping -- by hand	52,080 boxes † †	37.5 boxes † †	1,389	22	64
	Packing	52,080 boxes † †	75 boxes † †	695	22	32
	Grapes -- Concord: Picking	11,250 baskets † †	65. baskets † †	174	11	16 (October 1-15)
	Olives: Picking for pickling	1,400 tons †	300 pounds	9,334	22	425
	Prunes: Picking up	8,755 tons †	1.0 ton	8,755	11	796 (October 1-15)
November	Dipping and drying -- by dehydrator	4,378 tons †	†	2,627	11	239 (October 1-15)
	Dipping and drying -- by sun	4,377 tons †	†	3,633	11	331 (October 1-15)
	Walnuts: Knocking and picking up	287,625 pounds	200 pounds	1,439	22	66
	Totals			72,483	22	3,295 man-months
	Rice: Threshing -- by stationary Threshing -- by pick-up combine	74,618 cwt. 10,493 cwt. †	50.cwt. 125. cwt.	1,493 84	19 9	79 10 (November 1-15)
	Harvesting -- with direct combine	3,498 cwt.	125 cwt.	28	9	4 (November 1-15)

Table continued on next page.

Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
November (cont.)	Sorghums -- for grain: Cutting heads -- by hand	403 acres	0.75 acre	538	13	42 (November 1-20)
	Threshing -- by stationary	12,246 cwt. †	130 cwt.	95	13	8 (November 1-20)
	Threshing -- by combine	406 acres †	5.0 acres	82	13	7 (November 1-20)
	Seed crops -- melons, etc.: Picking and piling	925 acres	0.6 acre	1,542	9	172 (November 1-15)
	Threshing	925 acres	0.66 acre	1,402	9	156 (November 1-15)
	Almonds: Pruning	436 acres †	0.6 acre	727	19	39
	Brush disposal	436 acres †	4.5 acres	97	19	6
	Apples: Sorting and wiping -- by hand	22,320 boxes † †	37.5 boxes † †	596	19	32
	Packing	22,320 boxes † †	75 boxes † †	298	19	16
	Olives: Picking for pickling	1,399 tons †	300 pounds	9,327	19	491
	Oranges: Picking	8,377 boxes † †	50 boxes † †	168	19	9
	Peaches -- all: Pruning	596 acres †	0.25 acre	2,384	19	126
	Brush burning	372 acres †	2.5 acres	149	19	8
	Spraying	1,116 acres †	1.25 acres	893	19	47
December	Pears: Pruning	62 acres †	0.2 acre	310	19	17
	Brush burning	39 acres †	2.5 acres	16	19	1
	Prunes: Pruning	1,085 acres †	0.5 acre	2,170	19	115
	Brush disposal	678 acres †	2.5 acres	272	19	15
	Walnuts: Knocking and picking	38,350 pounds	200 pounds	192	9	22 (November 1-15)
	Totals			22,863	19	1,204 man-months
	Almonds: Pruning	436 acres †	0.6 acre	727	18	41
	Brush disposal	436 acres †	4.5 acres	97	18	6
	Apples: Sorting and wiping -- by hand	14,880 boxes † †	37.5 boxes † †	397	18	23
	Packing	14,880 boxes † †	75 boxes † †	199	18	12

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Table 3 continued.

Month	Crop and task	Size of task	Output per man-day	Required man-days	Available days	Required number of workers*
December (cont.)	Olives: Picking for oil, etc.	430,000 pounds†	335 pounds	1,284	18	72
	Oranges: Picking	4,511 boxes †	50 boxes †	91	18	6
	Peaches -- all: Pruning	595 acres †	0.25 acre	2,380	18	133
	Brush burning	372 acres †	2.5 acres	149	18	9
	Spraying	1,116 acres †	1.25 acres	893	18	50
	Pears: Pruning	62 acres †	0.2 acre	310	18	18
	Brush burning	39 acres †	2.5 acres	16	18	1
	Prunes: Pruning	1,084 acres †	0.5 acre	2,168	18	121
	Brush burning	678 acres †	2.5 acres	272	18	16
	Totals			8,983	18	500 man-months

* On a monthly basis unless otherwise noted.

† Estimated portion of the job done by seasonal workers.

‡ It should be noted this figure, rather than representing the number of workers required, represents the number of man-months of labor required and is derived by dividing the total number of man-days of labor by the number of days available for work during the month.

§ Hop pruning, stringing, and training estimated to require a total of 12 man-days per acre, 30 per cent each month in March, April, and May, and 10 per cent in June.

¶ Dry-yard labor, other than cutting, estimated to be as follows:

Peaches -- 11 1/2 man-hours per fresh ton.
Prunes, with dehydrator -- 6 man-hours per fresh ton.
Prunes, sun-drying -- 8.3 hours per fresh ton.

|| Twenty-eight pounds per crate.

** Green weight.

†† Dry weight.

‡‡ Boxes of 40 pounds net.

§§ Baskets of 5 pounds net.

¶¶ Boxes of 42 pounds net, field run.

TABLE 4
Summary of Seasonal Labor Needs by Months

Butte County

1935

Month	Required man-days of seasonal labor	Available days	Required man-months of seasonal labor
January	8,904	16	557
February	8,973	18	499
March	4,020	19	212
April	4,151	20	208
May	19,397	23	844
June	5,028	25	202
July	11,238	26	433
August	47,379	26	1,823
September	69,950	25	2,798
October	72,483	22	3,295
November	22,863	19	1,204
December	8,983	18	500
Total	283,369	--	12,575

Notes

Notes on Table 2.--Data concerning "time of need" as shown in this table break down required seasonal labor into the period in which the work is performed in order to permit a subsequent determination of labor needs by months (table 3). Some operations are performed only to a limited extent with seasonal labor. For instance, only 75 per cent of the work in harvesting wheat and barley is done by seasonal workers. When a job extends over several different months, the proportionate amount for each month is shown.

The amount of work done each month is based on the cropping system followed during 1935. The allotting of amounts of work is based on findings concerning local farm practices, and required time to "make" a crop resulting from inquiry of producers, and records of carlot shipments, the latter proving helpful in fixing dates of planting and of subsequent tasks involved in producing certain crops. Proportionate amounts of output harvested each month were determined from data of local practices with respect to harvesting, and from carlot shipments of perishable products. Records of truck shipments were also used when available.

Notes on Table 3.-- Table 3 is the condensed summary of labor needs as worked out for Butte County as a result of findings pertinent to 1935. The data are presented by months with the tasks which were performed in each month indicated by both crop and task. The size of the job was calculated from the data appearing in table 1 (acreage and production) and table 2 (task, time of performance, and percentage of work pertinent to a given month). The output per man-day was calculated as indicated in the foreword presenting table 3. The number of required man-days is a result of dividing the size of task by output per man-day. The available days for the different tasks involve two variables. The first is the number of days when field work is possible because of favorable weather conditions. The basis for this column was determined from a study of the monthly weather charts of the United States Weather Bureau for the years 1933, 1934, and 1935. These data indicated available days per month as follows (based on a 26-day working month without allowance for holidays):

Month	Available days	Length of work day	Month	Available days	Length of work day
		hours			hours
January	16	9	July	26	10
February	18	9	August	26	10
March	19	10	September	25	10
April	20	10	October	22	10
May	23	10	November	19	9
June	25	10	December	18	9

Source of data: Based on precipitation records of Chico station of the United States Weather Bureau for the years 1933, 1934, and 1935.

The second factor influencing the number of available days was the size of the job. If the output was only a few cars, then the number of days was limited to the time needed to get out those cars efficiently. If a field operation had to be performed in a period less than the number of available days in the month, then the specific number of days was noted. These restrictions are shown in parentheses. For example, in July picking of apples was limited to the last half of the month, picking freestone peaches to the last 10 days, etc.

The totals of table 3 show the total required man-days of needed seasonal labor, the available days for field work during the month, and the necessary number of men (as defined in the opening paragraph of table 3) required on a monthly basis to care for the tasks ordinarily performed by seasonal workers.

In an area such as Butte County, involving a variety of annual crops, the findings as set forth in this report are bound to fluctuate materially from year to year, because of the market outlook upon what and how much acreage is planted, and when it is planted; because of variable seasonal conditions affecting yields, time of performing operations, and available days; and because of harvesting operations on certain crops being speeded up to supply a good market, or retarded to avoid a poor one, resulting in marked variations in the need for harvest labor.

